

ABSTRACT OF THE DISCLOSURE

Disclosed is a single crystal substrate and a cutting method thereof.

A single crystal substrate includes a langasite substrate with a SAW propagation surface; and input and output IDTs having electrodes on the surface for launching and/or detecting surface acoustic waves, wherein a direction of surface wave propagation is parallel to an X'-axis, and the substrate further has an Z'-axis perpendicular to the surface and a Y'-axis parallel to the surface and perpendicular to the X'-axis, the langasite substrate having a crystal orientation defined by modified axes X, Y and Z, the relative orientation of axes X', Y' and Z' being defined by Euler angles  $\phi$ ,  $\theta$  and  $\psi$ , in which  $\phi$  is in a range of  $8^\circ \leq \phi \leq 25^\circ$ ,  $\theta$  is in a range of  $15^\circ \leq \theta \leq 30^\circ$ , and  $\psi$  is in a range of  $55^\circ \leq \psi \leq 85^\circ$ .